

## A CLOUD BANK AT SEA.

The Chief of the Division of Ocean Meteorology contributes the following extract from a record lately received by him:

At 2:30 a. m. of March 14, in crossing the North Sea from Copenhagen to North Shields, we witnessed a phenomenon of which I give you the following account:

Throughout the whole night it had been snowing heavily. At the above-named time we saw about a mile ahead of us (the ship's course at the time being SW. by W.  $\frac{1}{2}$  W.), lying on the water and rising to the height of the ship's rail, a sharply defined bank of clouds or some other object, having perfectly square edges, and extending from SW. by W.  $\frac{1}{2}$  W. to WSW., the remainder of the horizon being quite clear. Unable to decide what the object was, we brought the ship's head to WNW., and left it on our port beam. Immediately afterwards it started to blow very hard. Neither the chief officer nor myself had ever seen anything like it before. Barometer at the time 29.47 inches, wind WNW., force 4 to 5, and then increasing.—*Brilliant* (Ger. S. S.), Schroeder, report by Third Officer Leidhold.

## NORMALS IN WEATHER BUREAU RECORDS.

A correspondent addresses the Chief of Bureau as follows:

Kindly inform me what is the standard for normals of pressure, temperature, and rainfall referred to in Table I of the MONTHLY WEATHER REVIEW. I presume that it is the mean of certain periods accepted as normal. If so I should like to learn of the locus and length of these periods, and whether the application of the + or — departure to or from the monthly record is supposed to give the normal as a result.

In reply, the Division of Meteorological Records states that the values used as normals are the averages of all observations available from the beginning of record at the respective stations to the time the values were completed and put in operation. The normals of pressure now in use cover the period from 1873 to 1899, inclusive. Some stations contain the full 27-year record while the values for other stations are based on shorter periods. For temperature and precipitation the value used as normals cover the period from 1871 to 1895, inclusive. Some cover the entire period of twenty-five years, while at others the values are for shorter periods depending upon the dates upon which observations began at the several stations. As a rule normals are not prepared for stations having a record of less than ten years.

In computing these normals no attempt has been made to reduce the values at stations having shorter records to correspond with those covering the full period of years.

## A PLEA FOR THE TEACHING OF METEOROLOGY.

By R. H. CURTIS, Esq.

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The growth of an intelligent interest in meteorology on the part of the general public is manifesting itself in several ways. One very unmistakable sign of it, which everyone may note, is to be found in the amount of attention which is now paid to the subject of the weather by the daily press, and particularly to the forecasts of the weather published every morning. Not so very long ago there were comparatively few people who troubled themselves to look at these forecasts at all, and the majority of those who did do so regarded them as little more than guesses, generally good guesses, perhaps, because they were understood to have been made by people who had given more than ordinary attention to the subject, and presumably had by dint of long practice acquired more skill in reading the signs of coming changes in the weather than ordinary folk possessed; but they were rated as guesses nevertheless, with no more really scientific basis than existed for the predictions of "Old Moore".<sup>1</sup> But to-day the change is great. The forecast is the first thing looked at by thousands of men and women when they open their morning paper at breakfast, or

in the train, or on their way to business; and these forecasts are treated with respect as being scientific deductions from observed conditions of the atmosphere, considered in relation to the laws, as far as they are known, by which the movements of the atmosphere are governed. That is the gist of the reply which probably the majority of those who study the forecasts would make if asked to give their opinion about them, although, likely enough, very few could go a step further and give even the most elementary account of the laws themselves. It is, however, a step in advance that the public mind is beginning to accept the fact that there are any "laws" at all in the matter, and to recognize that the daily sequence of weather is not simply fortuitous, the result of the purest chance. When so much is admitted, a desire on the part of many to get some sort of acquaintance with the laws is sure to follow, and the day when all ordinarily well educated people will possess at least some elementary ideas of a sound nature about meteorology will thereby be brought considerably nearer.

But signs of the spread of this spirit of enquiry are not wanting even now, and its progress would seem to be more real than possibly many meteorologists suppose. Indeed it may not be amiss to express the hope that some meteorologists may themselves be stirred to acquire a better knowledge of the theoretical side of the subject than they already possess, for it is not an unknown experience to meet with men who make daily observations of the barometer and of temperature, who have a rain gauge, and know all about the rainfall of the district in which they live, and who locally have the reputation of being "meteorologists", but who nevertheless would be sorely puzzled if asked to describe a typical "depression", or to explain what is known as "Buys Ballot's law".

Anyone passing the Meteorological Office in Victoria street might see at almost any time in the day people stopping at the door, not merely to scan the forecasts exhibited there, but also to study the charts hung by their side, upon which the forecasts are based. Not infrequently when friends are examining these charts together, an interesting discussion, or perhaps explanation, may be heard regarding the relation of the forecast to the conditions indicated by the chart; it is not always that these explanations proceed upon orthodox lines, although frequently they do; but, be that as it may, they show that the broad principles of the subject are receiving some attention, and to that extent they are welcome indications of progress to all who are interested in the furtherance of the study of meteorology.

Another and still more promising indication of progress may also be noticed at the door of the Meteorological Office, at a particular part of the day, when the students from a neighbouring training college for schoolmasters going for, or returning from, their daily walk, gather in small groups round the charts, discussing the sequence of changes shown during the past few days, and sketching in their note books the present distribution of pressure and temperature, and the wind circulation, with a view to subsequent class lectures on the subject. In the direction which this fact indicates lies, we think, the great hope of popularizing the science of meteorology. Hitherto it has been almost entirely omitted from the curricula of our schools, and from the training of the teachers. Smatterings of it have found their way into that olla-podrida of the sciences which under the name of "physiography" has for years been a favourite subject with school teachers in the annual South Kensington Science examinations; but since in addition to meteorology the paper on this subject usually embraces questions in astronomy, geology, vulcanology, chemistry, and possibly other branches of science as well, it is obvious that the modicum of knowledge of each which a student who aspired to grapple with such a "general knowledge" paper would probably acquire, would be insufficient to enable him to teach any of them.

<sup>1</sup>Mr. Curtis here refers to a famous almanac published in the seventeenth century.—EDITOR.

But why should not meteorology now be regarded as a science sufficiently mature to be able to stand upon its own feet, and why should not school teachers be encouraged to take a course of study in meteorology as complete as is now usual in the case of botany or physiology? Teachers would then have a real acquaintance with the subject, and would be able to impart their knowledge satisfactorily to their pupils; and without doubt both teachers and taught would find the subject at once interesting and useful.

There are teachers who have already made this discovery and have profited by it. Of course in some schools, such as those for young seamen, or those for students of agriculture, meteorology naturally secures a prominent place; but in some "public elementary" schools the subject is also taught so far as first principals are concerned, and the interest of the pupils is further secured by getting them to observe instruments which have been provided as part of the school equipment.

In this country we, as a rule, move slowly, and although the inclusion of meteorology in the ordinary curriculum of school instruction has been advocated for many years, very little has yet been done to bring it about. But the growth of general interest in the subject to which we have drawn attention should we think aid materially in its accomplishment, and with the further development of that interest the time when meteorology shall form a common subject in schools of all grades should not be very distant.

#### ON "ABSOLUTE" VALUES.

In looking over the files of the section reports we notice a growing use of the word "absolute" that seems to be without official authority and that should be stopt, as it is objectionable for several reasons. The terms "absolute maximum" and "absolute minimum" frequently occur in climatology to express the highest maximum and lowest minimum that have occurred in a long series of observations at a given place. The difference between these extremes is the "absolute range" for that long period, and the term "absolute" is applicable only to a series of observations that is so long that the extreme temperatures and ranges may be supposed to approximate what would be given by a century or more of observation.

We use the expressions "maximum", "minimum", "extremes" for any given month or year, or for a short series of months or years, and always specify what that special period is.

In his translation of Hann's "Climatology" Prof. R. De C. Ward, on page 18, seems to apply the term "absolute" to a short series, but he does not intend this, as may be seen from the fact that he states that these data have very little value unless they are based on a long series of observations; and he illustrates the meaning and use of the word "absolute" on the next page by applying it to a series of ten years, while in the table on page 33 the term is applied by Hann only to a record of forty-six years. In the circular letter sent out by Prof. A. J. Henry, when gathering data for his Bulletin Q,<sup>1</sup> he called for "absolute maximum and minimum" in his temperature tables, but only expected these data from stations having long records.

As the use of the word "absolute" is liable to convey wrong impressions it has been strongly recommended that the simple expressions "maximum", "minimum", "range" for the month or the year, or a given number of years, be adopted for general use, and that the term "absolute" be left for special memoirs on climatology, where distinctions must be made between the periodic and nonperiodic features of climate.

In the best usage the word "absolute" refers to a single station and the oscillations thereat during a long period of time, but we notice a remarkable innovation in many of our

<sup>1</sup> "The Climatology of the United States", not "A Climatological Dictionary", as some erroneously call it.

section reports, where the term "absolute" is applied to variations over a large area, as over a State or section; thus, "the absolute maximum temperature for the State is 101° and the absolute minimum 45°". But a section rarely has more than a hundred stations, and no one can be sure that there are not many points in the State at which our extremes are exceeded. The term "absolute" is as inappropriate to our State sections as it is to our short records. One should simply say "highest recorded", "lowest recorded" in the State, without using the word "absolute", and should give the station and date as well as the temperature.

We note other peculiar phrases that are also objectionable; for instance, one section director instead of saying the "absolute highest" or "absolute maximum" writes the "highest absolute temperature" or the "lowest absolute temperature". Now the "absolute temperature" is a term long since pre-empted both by physicists and by meteorologists, and means the temperature counted upward from the absolute zero, as distinguished from the temperature centigrade, which is counted upward or downward from the freezing point, or as distinguished from the Fahrenheit scale where the temperature is counted upward or downward from the zero point chosen by Fahrenheit. The absolute temperature is usually found by adding 273 to the centigrade temperature; it would come to the same thing if we should add 459 to the Fahrenheit temperature. As the term "absolute temperature" is everywhere in common use it would be foolish to allow a new and loose usage to prevail in meteorological literature.

The phrases, "highest absolute maximum" and "lowest absolute minimum", are redundant and should be replaced by the simple expression "highest" or "lowest", omitting the word "absolute" as improper, and the words "maximum" or "minimum" as unnecessary. It is much clearer and more definite to say, "the highest temperature of the month at the station", or "the highest temperature recorded in the State" or "the maximum temperature for the State".

In another report we read, "the absolute minimum, 29°, at ———, is the lowest in fifteen years". It would be shorter and just as well to say, "29°, at ———, is the lowest recorded in fifteen years", omitting the words "absolute minimum".

Again, we read "the absolute maximum temperature for 1906", as tho the absolute maximum could occur, not merely once in a century, but once every year. The proper expression is "the highest temperature in 1906", or "the maximum temperature during 1906".

In another line occurs the expression "the highest absolute temperature for November, 1906, in the State of ———", as tho absolute temperatures could occur at every station, but the highest absolute could characterize some one point in the State. It would be a great deal better to say, "the highest temperature in the State during November, 1906".

From another report we quote an "absolute range of 100° in temperature for the month of February". The writer of this line evidently intends to say that the range of temperature for the month between the lowest at one station and the highest at another station somewhere within his section was 100°, and that this was the largest of all similar records for that month. His word "absolute", therefore, includes both the idea of time and geographical extension—not either one alone, but both. Now such a combined chronological and geographical range of temperature has no local climatological value. The figures are not comparable with those for any other section because everything depends upon the sizes of the sections and their orography, whether mountainous or flat, and their shape, whether elongated north and south, or east and west. The climatologist wants the range of temperature for each individual station; by comparing these ranges among themselves he may be able to discern the differences in the climate over different parts of the section. To be sure one might imagine